

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Currently Amended) A method for facilitating high speed network
2 packet flow byfor resolving conflicts between network service rules for network
3 data traffic in a system where rule patterns with longer prefixes match before rule
4 patterns with shorter prefixes, comprising:
5 collapsing various operations related to managing network flows into a
6 single flow classification and dispatch step;
7 receiving a set of network service rules for network data traffic from
8 multiple network services, wherein network service rules from different network
9 services can possibly conflict;
10 wherein each of the network service rules specifies, a filter that defines a
11 prefix for a set of packets in the packet flow, and an action list that specifies one
12 or more actions to be applied to the set of packets;
13 identifying a conflict between a higher priority rule and a lower priority
14 rule in the set of network service rules; ~~and~~
15 resolving the conflict by prepending an action list of the higher priority
16 rule to an action list of a rule with a filter that defines a longer prefix; and
17 applying a consistent set of rules to a switching mechanism to facilitate
18 packet flow management.

1 2. (Original) The method of claim 1, wherein if the set of packets
2 associated with the higher priority rule is equal to the set of packets associated

3 with the lower priority rule, resolving the conflict involves creating a new action
4 list for the higher priority rule by prepending the action list of the higher priority
5 rule to the action list of the lower priority rule.

1 3. (Original) The method of claim 1, wherein if the set of packets
2 associated with the higher priority rule is a superset of the set of packets
3 associated with the lower priority rule, resolving the conflict involves creating a
4 new action list for the lower priority rule by prepending the action list of the
5 higher priority rule to the action list of the lower priority rule.

1 4. (Original) The method of claim 1, wherein if the set of packets
2 associated with the lower priority rule is a superset of the set of packets associated
3 with the higher priority rule, resolving the conflict involves creating a new action
4 list for the higher priority rule by prepending the action list of the higher priority
5 rule to the action list of the lower priority rule.

1 5. (Original) The method of claim 1, wherein if the set of packets
2 associated with the lower priority rule intersects the set of packets associated with
3 the higher priority rule, resolving the conflict involves:
4 creating a new rule with a filter that defines the intersection of the set of
5 packets associated with lower priority rule and the set of packets associated with
6 the higher priority rule; and
7 creating an action list for the new rule by prepending the action list of the
8 higher priority rule to the action list of the lower priority rule.

1 6. (Original) The method of claim 1, wherein prior to modifying a
2 rule in the set of network service rules, the method further comprises cloning the

3 rule to ensure that potential conflicts with rules that appear later in the set of
4 network service rules are not overlooked.

1 7. (Original) The method of claim 1, wherein the priority of a given
2 rule is based upon one or more of the following:
3 a priority associated with a network service from which given rule
4 originated;
5 a count of the number of prefix bits specified by the filter for the given
6 rule; and
7 a time stamp indicating when the given rule was incorporated into the set
8 of network service rules.

1 8. (Original) The method of claim 1, wherein an action specified by a
2 network service rule can include, but is not limited to:
3 dropping a packet;
4 gathering statistical information about the packet;
5 controlling timer functions associated with the packet;
6 modifying the packet; and
7 passing the packet on.

1 9. (Original) The method of claim 1, wherein the multiple network
2 services can include, but is not limited to:
3 a firewall service;
4 a service level agreement monitoring service;
5 a load balancing service;
6 a transport matching service;
7 a failover service; and
8 a high availability service.

1 10. (Currently Amended) A computer-readable storage medium storing
2 instructions that when executed by a computer cause the computer to perform a
3 method for resolving conflicts between network service rules for network data
4 traffic in a system where rule patterns with longer prefixes match before rule
5 patterns with shorter prefixes, the method comprising:

6 collapsing various operations related to managing network flows into a
7 single flow classification and dispatch step;

8 receiving a set of network service rules for network data traffic from
9 multiple network services, wherein network service rules from different network
10 services can possibly conflict;

11 wherein each of the network service rules specifies, a filter that defines a
12 prefix for a set of packets in the packet flow, and an action list that specifies one
13 or more actions to be applied to the set of packets;

14 identifying a conflict between a higher priority rule and a lower priority
15 rule in the set of network service rules; and

16 resolving the conflict by prepending an action list of the higher priority
17 rule to an action list of a rule with a filter that defines a longer prefix.

1 11. (Original) The computer-readable storage medium of claim 10,
2 wherein if the set of packets associated with the higher priority rule is equal to the
3 set of packets associated with the lower priority rule, resolving the conflict
4 involves creating a new action list for the higher priority rule by prepending the
5 action list of the higher priority rule to the action list of the lower priority rule.

1 12. (Original) The computer-readable storage medium of claim 10,
2 wherein if the set of packets associated with the higher priority rule is a superset
3 of the set of packets associated with the lower priority rule, resolving the conflict

4 involves creating a new action list for the lower priority rule by prepending the
5 action list of the higher priority rule to the action list of the lower priority rule.

1 13. (Original) The computer-readable storage medium of claim 10,
2 wherein if the set of packets associated with the lower priority rule is a superset of
3 the set of packets associated with the higher priority rule, resolving the conflict
4 involves creating a new action list for the higher priority rule by prepending the
5 action list of the higher priority rule to the action list of the lower priority rule.

1 14. (Original) The computer-readable storage medium of claim 10,
2 wherein if the set of packets associated with the lower priority rule intersects the
3 set of packets associated with the higher priority rule, resolving the conflict
4 involves:

5 creating a new rule with a filter that defines the intersection of the set of
6 packets associated with lower priority rule and the set of packets associated with
7 the higher priority rule; and

8 creating an action list for the new rule by prepending the action list of the
9 higher priority rule to the action list of the lower priority rule.

1 15. (Original) The computer-readable storage medium of claim 10,
2 wherein prior to modifying a rule in the set of network service rules, the method
3 further comprises cloning the rule to ensure that potential conflicts with rules that
4 appear later in the set of network service rules are not overlooked.

1 16. (Original) The computer-readable storage medium of claim 10,
2 wherein the priority of a given rule is based upon one or more of the following:
3 a priority associated with a network service from which given rule
4 originated;

5 a count of the number of prefix bits specified by the filter for the given
6 rule; and
7 a time stamp indicating when the given rule was incorporated into the set
8 of network service rules.

1 17. (Original) The computer-readable storage medium of claim 10,
2 wherein an action specified by a network service rule can include, but is not
3 limited to:

4 dropping a packet;
5 gathering statistical information about the packet;
6 controlling timer functions associated with the packet;
7 modifying the packet; and
8 passing the packet on.

1 18. (Original) The computer-readable storage medium of claim 10,
2 wherein the multiple network services can include, but is not limited to:

3 a firewall service;
4 a service level agreement monitoring service;
5 a load balancing service;
6 a transport matching service;
7 a failover service; and
8 a high availability service.

1 19. (Currently Amended) An apparatus that resolves conflicts between
2 network service rules for network data traffic in a system where rule patterns with
3 longer prefixes match before rule patterns with shorter prefixes, comprising:
4 a mechanism configured to collapse various operations related to
5 managing network flows into a single flow classification and dispatch step;

6 a receiving mechanism configured to receive a set of network service rules
7 for network data traffic from multiple network services, wherein network service
8 rules from different network services can possibly conflict;
9 wherein each of the network service rules specifies, a filter that defines a
10 prefix for a set of packets in the packet flow, and an action list that specifies one
11 or more actions to be applied to the set of packets;
12 a conflict detection mechanism configured to identify a conflict between a
13 higher priority rule and a lower priority rule in the set of network service rules;
14 and
15 a conflict resolution mechanism configured to resolve the conflict by
16 prepending an action list of the higher priority rule to an action list of a rule with a
17 filter that defines a longer prefix.

1 20. (Original) The apparatus of claim 19, wherein if the set of packets
2 associated with the higher priority rule is equal to the set of packets associated
3 with the lower priority rule, the conflict resolution mechanism is configured to:
4 create a new action list for the higher priority rule by prepending the action
5 list of the higher priority rule to the action list of the lower priority rule; and to
6 delete the lower priority rule.

1 21. (Original) The apparatus of claim 19, wherein if the set of packets
2 associated with the higher priority rule is a superset of the set of packets
3 associated with the lower priority rule, the conflict resolution mechanism is
4 configured to create a new action list for the lower priority rule by prepending the
5 action list of the higher priority rule to the action list of the lower priority rule.

1 22. (Original) The apparatus of claim 19, wherein if the set of packets
2 associated with the lower priority rule is a superset of the set of packets associated

3 with the higher priority rule, the conflict resolution mechanism is configured to
4 create a new action list for the higher priority rule by prepending the action list of
5 the higher priority rule to the action list of the lower priority rule.

1 23. (Original) The apparatus of claim 19, wherein if the set of packets
2 associated with the lower priority rule intersects the set of packets associated with
3 the higher priority rule, the conflict resolution mechanism is configured to:
4 create a new rule with a filter that defines the intersection of the set of
5 packets associated with lower priority rule and the set of packets associated with
6 the higher priority rule; and to
7 create an action list for the new rule by prepending the action list of the
8 higher priority rule to the action list of the lower priority rule.

1 24. (Original) The apparatus of claim 19, wherein prior to modifying a
2 rule in the set of network service rules, the conflict resolution mechanism is
3 configured to clone the rule to ensure that potential conflicts with rules that appear
4 later in the set of network service rules are not overlooked.

1 25. (Original) The apparatus of claim 19, wherein the priority of a
2 given rule is based upon one or more of the following:
3 a priority associated with a network service from which given rule
4 originated;
5 a count of the number of prefix bits specified by the filter for the given
6 rule; and
7 a time stamp indicating when the given rule was incorporated into the set
8 of network service rules.

1 26. (Original) The apparatus of claim 19, wherein an action specified
2 by a network service rule can include, but is not limited to:
3 dropping a packet;
4 gathering statistical information about the packet;
5 controlling timer functions associated with the packet;
6 modifying the packet; and
7 passing the packet on.

1 27. (Original) The apparatus of claim 19, wherein the multiple network
2 services can include, but is not limited to:
3 a firewall service;
4 a service level agreement monitoring service;
5 a load balancing service;
6 a transport matching service;
7 a failover service; and
8 a high availability service.
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